

REMARKS

Claims 1 through 40 are currently pending in the application.

This amendment is in response to the final Office Action of June 5, 2006.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on Aronowitz et al. (U.S. Patent 6,033,998), taken with Mukhopadhyay et al. (U.S. Patent 6,399,448) and Barsan et al. (U.S. Patent 5,942,780)

Claims 1 through 40 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Aronowitz et al. (U.S. Patent 6,033,998) taken with Mukhopadhyay et al. (U.S. Patent 6,399,448) and Barsan et al. (U.S. Patent 5,942,780). Applicants respectfully traverse this rejection, as hereinafter set forth.

Applicants submit that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.

After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicants propose to amend independent claims 1, 15, 21 and 35 to clearly distinguish over the cited prior art. The Applicants assert that independent claims 8, 14, 28 and 34 presently include allowable subject matter over any combination of the cited prior art.

Turning to the cited prior art, the Aronowitz et al. reference teaches or suggests a method of fabricating gate dielectric layer having variable thicknesses and compositions over different regions of a semiconductor wafer. The wafer is exposed to remote low energy nitrogen plasma in a nitridization process having nitrogen cations which have energies of less than about 35 eV.

The Mukhopadhyay et al. reference teaches or suggests forming a multiple thickness gate oxide layer by implanting nitrogen ions in a first area of a semiconductor substrate while a second area of the substrate is masked for subsequent argon ion implantation.

The Barsan et al. reference teaches or suggests an integrated circuit having three different oxide layer thicknesses. Nitrogen implanted at 975° C for 30 seconds is used to retard growth of the oxide layer.

Applicants assert that any combination of the cited prior art Aronowitz et al. reference, the Mukhopadhyay et al. reference, and the Barsan et al. reference fails to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the claimed inventions of presently amended independent claims 1, 15, 21 and 35 or previously presented claims 8, 14, 28 and 34 because, any combination of the cited prior art Aronowitz et al. reference, the Mukhopadhyay et al. reference, and the Barsan et al. reference fails to teach or suggest all the claim limitations of the claimed inventions.

Applicants assert that any combination of the cited prior art Aronowitz et al. reference, the Mukhopadhyay et al. reference, and the Barsan et al. reference fails to teach or suggest the claim limitations of presently amended independent claims 1, 15, 21, and 35 because, claims 1 and 15 call for the claim limitations of, “forming a first resist over at least a portion of the oxide layer; patterning the first resist to create at least one exposed area of the oxide layer and at least one masked area of the oxide layer; hardening the at least one exposed area of the oxide layer...stripping the first resist; forming a second resist over at least a portion of the oxide layer masked by the first resist; patterning the second resist to create at least one exposed area of the oxide layer and conducting a second remote plasma nitrogen hardening treatment...”, while claim 21 calls for the claim limitations of, “forming a first resist over at least a portion of the oxide layer; patterning the first resist to create at least one exposed area of the oxide layer and at least one masked area of the oxide layer; hardening the at least one exposed area of the oxide layer...stripping the first resist; forming a second resist over at least a portion of the oxide layer masked by the first resist; patterning the second resist to create at least one second exposed area of the oxide layer; and hardening the at least one second exposed area of the oxide layer”, and claim 35 calls for the claim limitations of, “forming a first resist over at least a portion of the oxide layer; patterning the first resist to create at least one exposed area of the oxide layer and at least one masked area of the oxide layer; hardening the at least one exposed area of the oxide layer...; stripping the first resist; forming a second resist over at least a portion within the oxide

layer masked by the first resist; patterning the second resist to create at least one second exposed area of the oxide layer; and conducting a second remote plasma nitrogen hardening treatment...”

Each of independent claims 8, 14, 28 and 34 recite the claim limitations of, “forming a second resist over at least a portion of the at least one thick area within the oxide layer; patterning the second resist to create at least one exposed area of the at least one thick area;” and conducting a second hardening treatment to create at least one second hardened area and at least one second nonhardened area within the at least one thick area of the oxide.

As observed by the Examiner Aronowitz et al., “lacks patterning a second resist pattern and hardening the second exposed area of the oxide layer...” (Office Action, page 2). Mukhopadhyay et al. describes a second resist pattern, but the second exposed area is implanted with argon ions which, enhances oxide growth; not hardened, which represses oxide growth as required by each of independent claims, 1, 8, 14, 15, 21, 28, 34 and 35. The Barsan et al. reference also describes a second resist pattern, but it is not formed over “a portion of the oxide layer masked by the first resist” as required by each of claims 1, 15, 21 and 35 or is it formed over at least one thick area and patterned to expose the a portion of the at least one thick area, which is subsequently hardened, as required by each of claims 8, 14, 28 and 34.

Therefore the combination of Aronowitz et al. taken with Mukhopadhyay et al. and Barsan et al. fails to teach or suggest each and every element of claims 1, 8, 14, 15, 21, 28, 34 and 35 and as such claims 1, 8, 14, 15, 21, 28, 34 and 35 are allowable over any combination of Aronowitz et al. taken with Mukhopadhyay et al. and Barsan et al. under 35 U.S.C. § 103(a).

Each of claims 2 through 7, 9 through 13, 16 through 20, 22 through 27 and 29 through 33 depend from one of claims 1, 8, 14, 15, 21, 28, 34 or 35 which are allowable and as such are equally allowable as well as for any patentable material disclosed therein.

Applicants request entry of this amendment for the following reasons:

The amendment is timely filed.

The amendment does not require any further search or consideration.

The amendment places the application in condition for allowance.

Applicants submit that claims 1 through 40 are clearly allowable over the cited prior art.

Serial No. 10/791,006

Applicants request the entry of this amendment, the allowance of claims 1 through 40,
and the case passed for issue.

Respectfully submitted,



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Date: August 1, 2006
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